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Region 3

R. Price

UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

2 WATERSHED REPORT

Pasture 75 Pilot Watershed Project

1963

Black Kettle District

Panhandle National Grasslands

6200-7

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WATERSHED REPORT

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Submitted: July 15, 1963

J. H. Freeman

District Ranger

P-75 WATERSHED PROJECT

A. Description and Location of the Project

Pasture 75 was selected as a pilot watershed project. The pasture included many large (over 10 ft. deep or wide) gullies similar to those found in other pastures and land located in the county. There was also a small area subject to wind erosion. Pasture 75 contains 280 acres. Local SCS personnel furnished technical assistance by providing the survey of terraces and stock dams, by providing information on fertilizer application, rates of seeding, and other information as needed. A grass drill was also provided at no cost.

The main objective was to control gully erosion with gully plugs and diversion terraces and to slope and rehabilitate gullies. No ASC approved practice using gully plugs is now being used in the county.

Because original estimates were high, additional work was also accomplished in portions of pastures 66 and 85. The total area treated in all three pastures was 480 acres. Because of the intensive treatment, established photo points, etc., only a map of pasture 75 is shown although cost figures are based on all work accomplished.

In addition to work performed on Forest Service land, a small area above government land in pasture 66 was treated at a cost of $96.00 to the landowner.

B. Range Sites and Soils

Range sites and soils vary with five different range sites as classified by the SCS. The majority of the pasture is in the Shallow Prairie site.

1. Shallow Prairie Site

Soils are shallow, heavy and dark in color, and are of the Quinlin Woodward loam series. Slopes are steep to rolling. Runoff is great. Photo points 5 and 9 show areas of this site.

2. Sandy Prairie Site

This is a deep sandy loam site that takes water

moderately fast. Slopes are gently rolling to steep. Grass productivity is high. Soils on this site found in pasture 75 are of the Springer and Miles fine sandy loam series. The foreground of photo point #7 shows an area of this site.

3. Eroded Prairie Site

This site contains soils of the Quinlan series that are severely eroded. This site in pasture 75 is in an area of former cultivation. Photo points 1, 2, 3, 4, and 7 show areas of this site.

4. Eroded Sandyland Site

This is a severely eroded sandy site. Wind and water erosion is active. Photo points 6 and 8 are located in this type.

5. Red Shale Site

The soils of this site vary from very shallow to deep. The soils found on this site in pasture 75 are of the Vernon Quinlan series. The presence of red shale hills or breaks occurs on this site. Runoff is high. The more shallow soils produce little grass.

The above descriptions of range sites and soils are taken from the SCS Land Capability Guide for Rolling Red Plains Soils (Oklahoma).

C. Climate of Area

The average precipitation is 24 inches with fluctuation ranging from a high of 45 inches to a low of 12 inches. Most of the precipitation falls during the growing season with over 45 percent falling during the spring months. Rains often are of high intensity and most of the flood producing storms occur in April, May and June. The average wind velocity is 14 miles per hour. The highest velocities occur in the spring and can cause severe wind damage on sandy soils not protected by cover.

D. Vegetation

Vegetation of the pasture is little bluestem, sand bluestem, sideoats grama, blue grama and buffalograss, depending on the site. No analysis has been done on the pasture but estimates by both SCS and Forest Service personnel rate the pasture as being in low good or high fair condition.

E. Cost Data

1. Diversion Terraces

Ft. of terraces built	4800	
Average cu. yds./ft.	75	
Approximate cu. yds.	3600	
Total Cost of Diversion Terraces		$ 354.00
Approximate Cost/ft.		.07
Approximate Cost/cu. yd.		.10

2. Stock Dams

South Dam - Pasture 75 - 5649 cu. yds.	
Earth work, 61 hrs. @ $12.00/hr.	$ 732.00
Cost of 130' of 12" pipe	362.74
Cost to install pipe	16.00
Total	$1110.74
North Dam - Pasture 66 - 4451 cu. yds.	
Earth work, 63½ hrs. @ $12.00/hr.	762.00
Dig core, 10½ hrs. backhoe @ $8/hr.	84.00
Cost of 130' of 12" pipe	362.74
Cost to install pipe	40.00
Total	$1248.74
Total cu. yds.	10100
Total cost of earth work	$1578.00
Total cost of structures	$2359.48
Average cost per cu. yd. for earth work	$ .156
Average cost per cu. yd. for completed structures	$ .234

3. Gully Plugs

Total no. of gully plugs	68	
Average size of gully plugs	150	cu.yd.
Earth work - 99½ hrs. @ $12.00/hr.	$1194.00	
Average cost per gully plug	17.55	
Average cost per cu. yd.	.117	

4. Intensive Treatment - Blow Area

Intensive treatment of 3 acres subject to wind and water erosion.

5½ hrs. earth work @ $12.00/hr.	$ 66.00
Includes leveling and building of 6 gully plugs	
2 ton grass hay including hauling	46.00
5 rolls (7500 ft.) mulch netting	123.75
600 lb. 16-20-0 fertilizer @ 4.20	25.20
Grass seed and drilling	5.00
Labor - 24 man hrs. - mulching, fertilizing, tie down netting, etc.	48.00
Total Cost	$ 313.95

Average cost per acre $ 104.65

Comparative Cost:
Cost of mulch netting eliminated with added labor by use of heavy mulch such as broomcorn stover.

Total estimated cost	$ 166.00
Estimated average cost/acre	55.00

5. Sod Chute .7 acres

11½ hrs. earth work @ $12.00	$ 138.00
64 man hrs. labor for bermuda sprigging	128.00
5 lbs. bermuda grass seed	5.00
mileage for hauling bermuda grass	10.00
Total Cost	$377.00

Comparative Cost:

2 structures, total 2500 cu. yds.	---
210 ft. 6" pipe for above @ $1.80	$378.00

6. Fencing

Work includes removal and rebuilding of 1-1/2 miles of fence and fencing 3 plots.

Materials	$1400.00
Labor	450.00
Mileage	40.00
Total cost approx. 2¼ miles fence	$1890.00
Average cost/mi.	$ 840.00

7. Shinnery Spraying

*Cost figures based on 1500 acres sprayed on district.

Area sprayed	183 acres
*Cost/acre	$ 2.73
*Total Cost	$ 499.59

8. Seeding

Approximately 200 lb. of grass seed was used at a cost of $0.50/lb.	$ 100.00
Tractor rental	18.00
Labor	48.00
Approximate cost of seeding	$ 166.00

Cost Summary

Diversion Terraces	$ 354.00
Stock Dams	2359.48
Gully Plugs	1194.00
Treat Blow Area	313.95
Sod Chute	377.00
Fencing	1890.00
Shinnery Spraying	499.59
Seeding	166.00
Total Cost	$7154.02
Total Area Treated	480 acres
Average cost/acre	$ 14.90

Total cost for erosion control treatment only (Total minus fencing & shinnery spraying)	$4764.43
Average cost/acre for erosion control (Includes 2 stock dams)	$ 9.93

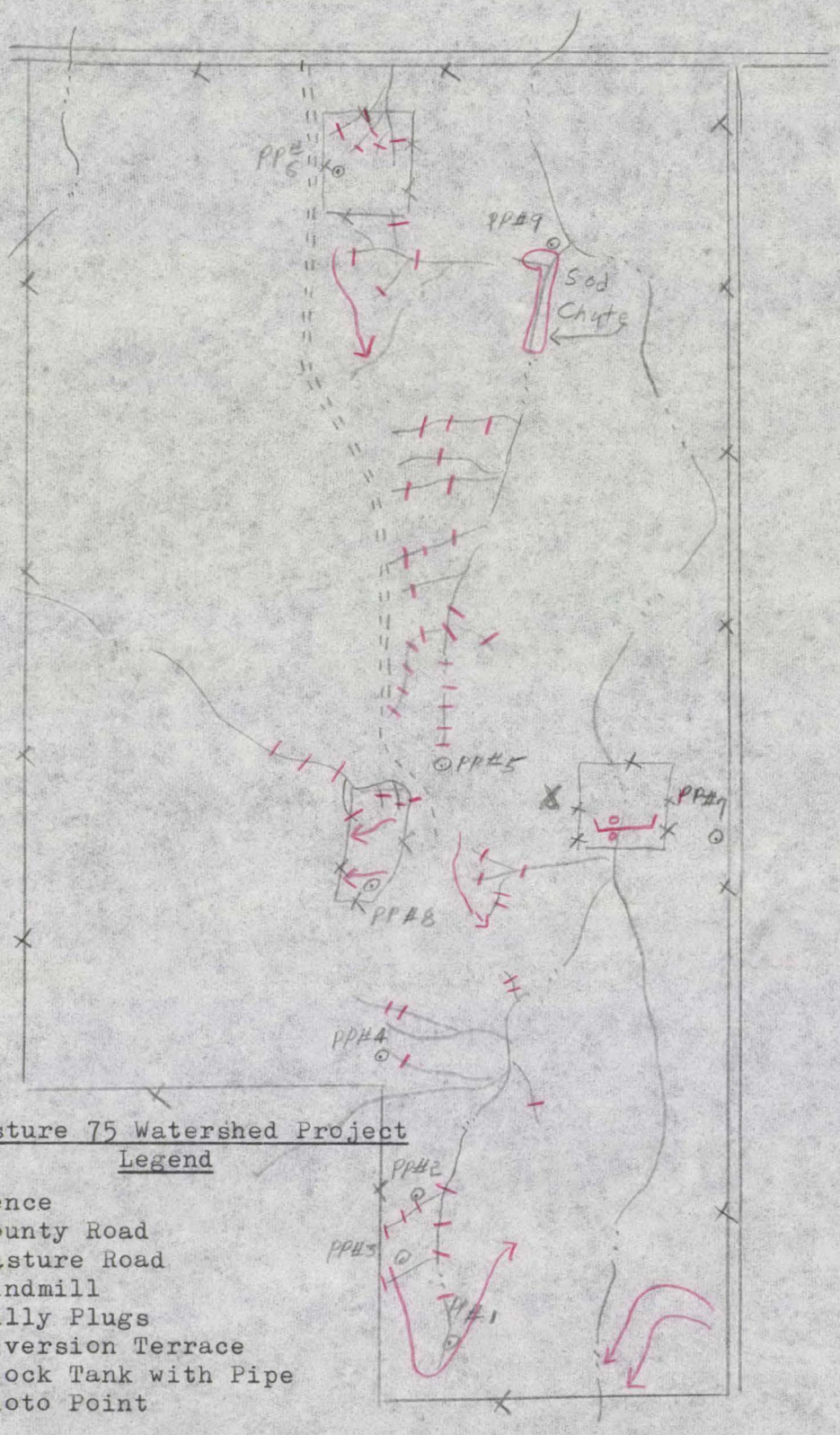
F. Summary

A total of 480 acres of range land in pastures 75, 66 and 85 was treated for erosion control with a system of gully plugs, diversion terraces, and stock dams. All earth work including construction of terraces was done with a TD-15 International tractor with dozer attachment. In addition 183 acres was sprayed for shinnery control. All disturbed areas were reseeded either by hand or by grass drill at a rate of 15/lbs./acre or 3 lbs. of live seed/ acre. All seeding was done with the following mixture:

Little bluestem
Sideoats grama
Switchgrass
Blue grama
Sand Bluestem
Sand Lovegrass

A small 3 acre area subject to wind erosion (photo point 6) was given intensive treatment by leveling, gully plugs, 200 lbs. of 16-20-0 fertilizer/acre, drilled and overseeded (with drill, overseeder pulled up existing grass plants), mulched with grass hay mulch at the rate of 2 ton/acre, and the hay tied down with mulch netting. The cost of this could have been reduced to almost half by using a heavy mulch such as broomcorn stover.

One area of downstream headcutting (photo point 9) was treated by sloping sides of gullies and sprigging and planting to bermuda grass. Cost of this could be reduced by seeding only. Although the cost of the sod chute appears to be high this was still of lower cost than the alternative treatment of two structures with drop pipes.

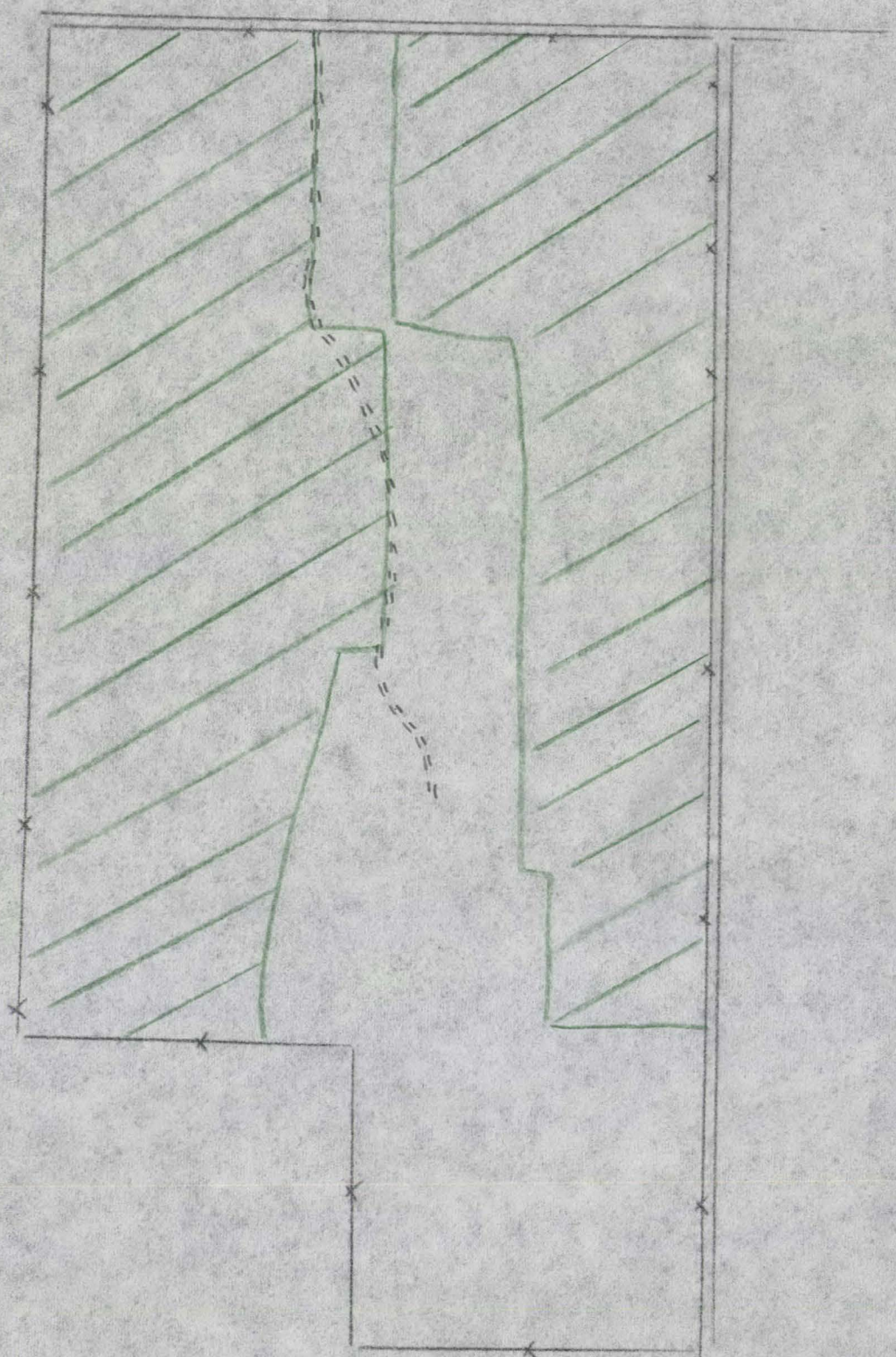


Pasture 75 Watershed Project

Legend

- Fence
- County Road
- Pasture Road
- Windmill
- Gully Plugs
- Diversion Terrace
- Stock Tank with Pipe
- Photo Point

PP # 7



Pasture 75 Watershed Project
Shinnery Control area
183 acres

PASTURE 75 WATERSHED PROJECT
BLACK KETTLE DISTRICT

Photo Point #1, February 7, 1963
Partial construction of gully plugs in SW drainage at south end of pasture. Picture faces approximately N8°E from Photo Point 1. Photo Point is cedar post approximately 1-1/2 chains north of bend in terrace.

Photo Point #1, June 19, 1963

Photo Point #2a, February 7, 1963
Picture faces approximately S65°W. Shows headcutting of gully toward west. Headcut is approximately 20 feet on west side of fence in top of picture. Average depth of gully is 10 ft. Photo Point is cedar post on north end of lower gully plug.

Photo Point #2a, June 19, 1963

Photo Point #2b, February 7, 1963.
Picture faces approximately N80°E from same point as Photo Point #2a. Shows confluence of 2 side gullies running into main channel.

Photo Point #2b, June 19, 1963
Gully plug built to intercept 2 gullies entering main channel.

Photo Point #3, February 7, 1963.
Diversion terrace at south end of pasture. Picture faces approximately S18°E from Photo Point. Photo Point is cedar post at NW end of diversion terrace.

Photo Point #3, June 19, 1963.

Photo Point #4, February 7, 1963
Erosion resulting from old road where pasture corners south and west on west side of pasture south of windmill. Picture faces S42°E from Photo Point. Photo Point is cedar post about 1-1/2 chains NW of fence corner.

Photo Point #4, June 19, 1963

Photo Point #5, February 7, 1963.
Picture looking north down west draw just east of ridge road. Photo Point is cedar post 100 ft. south of first dam at top of draw.

Photo Point #5, May 7, 1963.

Photo Point #6, February 8, 1963.
Blow area in north end of pasture. Area was subject to wind and water erosion. Photo Point is cedar post approximately 1 chain east of west fence.

Photo Point #6, March 14, 1963.
Drilling grass seed on area.

Photo Point #6, June 19, 1963.
Blow area at north end of pasture. Saddle area was leveled, seeded with grass drill, fertilized, mulched with grass hay, and mulch netting placed over mulch.

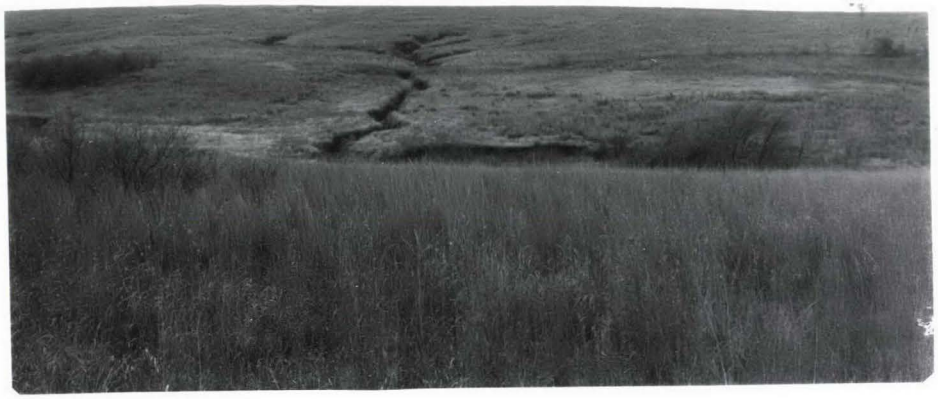


Photo Point #7, February 8, 1963.
Photo looking west from County Road just east of windmill. Picture faces S50°W. Photo Point is cedar post 2 ft. west of fence.

Photo Point #7, June 19, 1963.
Shows completed construction of gully plugs, terraces, and stock dam.

Photo Point #8, February 8, 1963.
Erosion area west of windmill. Area was subject to water and some wind erosion. Picture faces N5°W. Photo Point is cedar post at SE corner of fence surrounding erosion area.

Photo Point #8, May 7, 1963.
Area was terraced, drilled with grass seed, fertilized, and top of terraces mulched and tied down with mulch netting.

Photo Point #9, February 12, 1963.
Picture taken looking south up gully in area of lower headcutting. Photo Point is cedar post approximately 1 chain north of sod chute.

Photo Point #9, May 1, 1963.
Sprigging of bermuda grass for sod chute. Area was also seeded to bermuda grass.